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1990 Annual AMS-MAA Survey

(First Report)

Report on the 1990 Survey of New Doctorates, *Donald E. McClure*
Salary Survey for New Doctorates
Faculty Salary Survey

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Doctoral Degrees Conferred, 1989–1990

This first report on the 1990 Survey includes a report on the 1990 survey of new doctorates, a report on salaries of new doctorates, salary data on faculty members in four-year colleges and universities, and a list of names and thesis titles for members of the 1989-1990 Ph.D. class. The report is based on information collected from questionnaires distributed in May to departments in the mathematical sciences in colleges and universities in the United States and Canada, and later to the recipients of doctoral degrees granted by these departments between July 1989 and June 1990, inclusive. A further questionnaire was distributed in September, concerned with data on fall enrollments, majors, and departmental size. This data will appear in the second report on the 1990 Survey, in a spring 1991 issue of *Notices*.

For these reports, departments are divided into groups according to the highest degree offered in the mathematical sciences. The groups are described in the box below.

The 1990 Annual AMS-MAA Survey represents the thirty-fourth in an annual series begun in 1957 by the Society. The 1990 Survey is under the direction of the AMS-MAA Data Committee whose members are Edward A. Connors (chair), Lincoln K. Durst (consultant), John D. Fulton, James F. Hurley, Charlotte Lin, Don O. Loftsgaarden, David J. Lutzer, James W. Maxwell (ex officio), Donald E. McClure, and Donald C. Rung. Comments or suggestions regarding this Survey may be directed to the committee.

Groups I and II include the leading departments of mathematics in the U.S. according to the 1982 assessment of Research-Doctorate Programs conducted by the Conference Board of Associated Research Councils in which departments were rated according to the quality of their graduate faculty. 1
Group I is composed of 39 departments with scores in the 3.0-5.0 range
Group II is composed of 43 departments with scores in the 2.0-2.9 range.
Group III contains the remaining U.S. departments reporting a doctoral program.
Group IV contains U.S. departments (or programs) of statistics, biostatistics and biometrics reporting a doctoral program.
Group V contains U.S. departments (or programs) in applied mathematics/applied science, operations research and management science which report a doctoral program.
Group Va is applied mathematics/applied science; **Group Vb** is operations research and management science.
Group VI contains doctorate-granting departments (or programs) in the mathematical sciences in Canadian universities.
Group M contains U.S. departments granting a master's degree as the highest graduate degree.
Group B contains U.S. departments granting a baccalaureate degree only.

1These findings were published in *An Assessment of Research-Doctorate Programs in the United States: Mathematical and Physical Sciences*, edited by Lyle V. Jones, Gardner Lindzey, and Porter E. Coggeshall, National Academy Press, Washington, D.C., 1982. The information on mathematics, statistics and computer science was presented in digest form in the April 1983 issue of *Notices*, pages 257-267, and an analysis of the above classifications was given in the June 1983 *Notices*, pages 392-393. For a listing of departments in Groups I and II see April 1988 *Notices*, pages 532-533.

Highlights

1. 933 doctorates in the mathematical sciences were awarded by U.S. institutions in the period July 1, 1989 through June 30, 1990. This is an increase of 3 percent over last year and is 15 percent greater than the average of the fall counts for the last four years.

2. 401 U.S. citizens are reported to have received doctorates in the mathematical sciences. This is 43 percent of the total awarded by U.S. institutions, the lowest percentage ever reported. In part, the low percentage is explained by the relatively high numbers of new doctorates awarded to non-U.S. citizens. The number of U.S. citizens receiving doctorates is slightly lower than the number reported last year, and still strikingly lower than the numbers reported up to the early 1980s, but it remains more than 10 percent above the record low numbers reported in 1986-87 and 1987-88.

3. 22 percent of the U.S. citizen doctorates were awarded to women, less than the historical high of 24 percent in 1988-89, and equal to the percentage awarded to women over the preceding four years.

4. 17 percent of the new doctorates hired in U.S. doctorate-granting departments were women, while 18 percent of the new doctorates (regardless of citizenship) were women.

5. 4 of the 401 U.S. citizen doctorates were black. The higher number (9) reported in 1988-89 apparently does not signal a trend of increased representation of blacks among new doctorates.

6. The median starting salary of new doctorates reporting teaching (or teaching and research) was $32,000 for men and $32,500 for women.

Report on the 1990 Survey of New Doctorates

Donald E. McClure

This report presents a statistical profile of new doctorates in the mathematical sciences awarded by universities in the United States and Canada during the period July 1, 1989, through June 30, 1990. It includes the employment status of recipients of 1989-90 doctorates in the mathematical sciences (as of October 5, 1990), an analysis of the data by sex, racial/ethnic group and citizenship, and reports trends in the number of doctoral degrees for each of Groups I through V (see box on preceding page for description of groups). Table 1 provides the response rates for the 1990 Survey of New Doctorates.

TABLE 1: Response Rates

Group I	39 of 39
Group II	41 of 43 including 2 with 0 degrees
Group III	75 of 86 including 18 with 0 degrees
Group IV	54 of 74 including 6 with 0 degrees
Group Va	9 of 16
Group Vb	18 of 33 including 4 with 0 degrees
Group VI	18 of 30 including 4 with 0 degrees

Doctorates Granted

The number of new doctorates reported in 1989-90 by U.S. and Canadian mathematical sciences departments is 991. Table 2A gives the fall counts for the past five Annual Surveys. This year's fall count will be updated in the Second Report of the 1990 Survey, to appear in a spring 1991 issue of *Notices*. Table 2B reports for comparison the fall and spring counts in the years 1985-86 through 1988-89.

Table 2A: New Doctorates, Fall Counts

	85-86	86-87	87-88	88-89	89-90
U.S.	756	779	804	905	933
Canada	45	66	52	53	58
Total	801	845	856	958	991

Table 2B: New Doctorates, Fall and Spring Counts

	85-86		86-87		87-88		88-89		89-90	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
U.S.	756	782	779	808	804	828	905	919	933	*
Canada	45	45	66	66	52	55	53	62	58	*
Total	801	827	845	874	856	883	958	981	991	*

* To appear in a spring 1991 issue of *Notices*.

In Table 2C we record the number of new doctorates in the mathematical sciences in the U.S. from the years 1985-86, exclusive of Group Vb. The response rate for Group Vb, which includes departments in engineering and management science, is the lowest of all groups.

Table 2C: New Doctorates Awarded by Groups I-Va

	85-86 *	86-87	87-88	88-89	89-90
I-Va	698	743	760	854	864**

** This is a fall count. The other entries in Table 2C are spring counts. Table 2C will be updated to include a spring count for 1989-90 in a spring 1991 issue of *Notices*.

Employment Status of New Doctorates, 1989-1990

Table 3A shows the employment status, by type of employer and field of degree, of the 991 recipients of doctoral degrees conferred by the mathematical sciences departments in the U.S. and Canada between July 1, 1989, and June 30, 1990. The names of these individuals are listed with their thesis titles in a later section of this First Report of the 1990 Annual Survey. Again this year we present the employment status of the 183 women new doctorates in Table 3B. The employment information was obtained initially from the departments granting the degrees and subsequently from data provided by the degree recipients themselves.

The first five rows of Table 3A give the numbers of new doctorates who have accepted appointments in U.S. doctorate-granting mathematical sciences departments (Groups I-V). The next two rows give the numbers who have accepted appointments in mathematical sciences departments granting masters and bachelors as the highest degrees.

There was an increase in the number of new doctorates hired in Groups I-V (259 compared to 240 last year and 207 two years ago). Most of the increase occurred among Group III departments. The number hired by Group I departments is essentially the same as last year, and still over 40 percent above the levels reported in 1986-87 and 1987-88. Excluding those whose employment status is unknown, 28 percent of the men and 25 percent of the women new doctorates accepted appointments in Group I-V departments.

Most new doctorates accepted academic positions. Of the 678 new doctorates employed in the U.S., 66 percent (446) assumed positions in university or four-year college mathematical sciences departments, a two percentage point decrease from last year. Sixteen percent (107) assumed positions in government, business and industry, a fraction of a percentage below last year. The marginal decreases in these percentages do not reflect reductions in total employment in these sectors; instead, they are due to increased employment overall weighted towards other types of employers, for example, research institutes and other academic departments.

Table 3A shows as "not yet employed" about 5.7 percent of the 1989-90 new doctorates, excluding those whose employment status is unknown. At the same time last year, 6.8 percent of the 1988-89 new doctorates were reported as "not yet employed". The data in Table 3A were obtained in many instances early in the summer of 1990 and do not reflect subsequent hiring; an update of Table 3A is planned for the Second Report in a spring 1991 issue of *Notices*. In a similar update last year, the percentage of 1988-89 new doctorates who had reported not finding employment was 3.1 percent (see *Notices*, November 1989, page 1157, and July/August 1990, page 660).

Table 3A: Employment Status of 1989-1990 New Doctorates in the Mathematical Sciences

Type of Employer	Algebra or Number Theory	Real or Complex Analysis	Geometry or Topology	Logic	Probability or Statistics	Applied Mathematics	Discrete Mathematics or Combinatorics	Numerical Analysis	Linear or Nonlinear Optimization	Other	Total
Group I	19	26	39	1	2	4	4	4		2	101
Group II	12	7	7		3	9	5	2		1	46
Group III	7	7	10	3	9	17	3	4	1	2	63
Group IV					30				1		31
Group V					4	9	2		1	2	18
Masters	12	12	9	3	22	12	6	1	2	3	82
Bachelors	22	12	12	6	17	20	10	2		4	105
Two-year Colleges	1	1	2		1	2		1		1	9
Other Academic Departments	5	5	4	1	34	18	2	3	5	7	84
Research Institutes	2	4	7		7	8	1	1	1	1	32
Government	1	1			9	4			1	1	17
Business and Industry	2	4	2	2	51	13	4	6	2	4	90
Canada, Academic	7	2	2	1	9	6	6	1	2	2	38
Canada, Nonacademic					7	2			1		10
Foreign, Academic	12	19	10	5	46	26	6	6	3	9	142
Foreign, Nonacademic	1		2		5	2					10
Not seeking employment	1		1		5	1	1	2	1		12
Not yet employed	8	8	5	1	11	10	4	2	3	2	54
Unknown	2	6	6	2	10	7	3		2	9	47
Total	114	114	118	25	282	170	57	35	26	50	991

Table 3B: Employment Status of 1989-1990 New Doctorates in the Mathematical Sciences Females Only

Type of Employer	Algebra or Number Theory	Real or Complex Analysis	Geometry or Topology	Logic	Probability or Statistics	Applied Mathematics	Discrete Mathematics or Combinatorics	Numerical Analysis	Linear or Nonlinear Optimization	Other	Total
Group I	1	2	7			1	1				12
Group II	3		2		2		1				8
Group III	1	1	2			5		1		1	11
Group IV					9						9
Group V					1		1			2	4
Masters		2	2	1	3	2	4			2	16
Bachelors	3	2	5	1	2	4				2	19
Two-year Colleges					1	1		1		1	4
Other Academic Departments	2				10	6				3	21
Research Institutes					2					1	3
Government					2						2
Business and Industry		1			9	4		1		1	16
Canada, Academic	2			1	3	1	1				8
Canada, Nonacademic					2						2
Foreign, Academic	3	2	1	1	6	6		1		1	21
Foreign, Nonacademic											
Not seeking employment			1		2		1	2			6
Not yet employed	1		1		4	2		2	1		11
Unknown	1	2			4	2				1	10
Total	17	12	21	4	62	34	9	8	1	15	183

TABLE 4: Sex, Racial/Ethnic Group, and Citizenship of New Doctorates

July 1, 1989 - June 30, 1990

U.S. DEGREES	MEN					WOMEN					TOTAL
RACIAL/ETHNIC GROUP	CITIZENSHIP				Total Men	CITIZENSHIP				Total Women	
	U.S.	Canada	Other	Not Known		U.S.	Canada	Other	Not Known		
Asian, Pacific Islander	13	1	255	1	270	10		52		62	332
Black	3		6		9	1				1	10
American Indian, Eskimo, Aleut	2				2						2
Mexican American, Puerto Rican, or other Hispanic	5		29		34	3		1		4	38
None of those above	276	7	127		410	72	1	25		98	508
Unknown	13	1	21	2	37	3		2	1	6	43
Total	312	9	438	3	762	89	1	80	1	171	933

CANADIAN DEGREES	MEN					WOMEN					TOTAL
RACIAL/ETHNIC GROUP	CITIZENSHIP				Total Men	CITIZENSHIP				Total Women	
	U.S.	Canada	Other	Not Known		U.S.	Canada	Other	Not Known		
Asian, Pacific Islander		3	2	1	6		3			3	9
Black							1			1	1
American Indian, Eskimo, Aleut											
Mexican American, Puerto Rican, or other Hispanic											
None of those above	1	23	5	1	30		1	2		3	33
Unknown		9	1		10	1	4			5	15
Total	1	35	8	2	46	1	9	2		12	58

Sex, Racial/Ethnic Group, and Citizenship of New Doctorates, 1989-1990

Table 4 presents a breakdown according to sex, racial/ethnic group, and citizenship of the new doctorates. The information reported in this table was obtained from departments granting the degrees and in some cases from the recipients themselves.

Of the 933 doctorates awarded by U.S. universities, the citizenship is reported as known for 929 recipients, with 401 reporting U.S. citizenship. Thus, only 43 percent of the doctorates awarded by U.S. institutions went to U.S. citizens. This is a record low for the percentage of U.S. citizens since citizenship data started being reported in 1973-74.

Two factors are reflected in the low percentage of U.S. citizens: (1) the number of U.S. citizens receiving doctorates remains low, down from last year and barely over 400 for only the second time in the past six years, and (2) the number of non-U.S. citizens receiving doctorates has been increasing (528 this year compared to 473 last year and 435 two years ago). Refer to Table 5 and the accompanying graphs.

Among the U.S. citizens receiving doctorates in the mathematical sciences, 4 were black (3 men, 1 woman) and 8 were Mexican American, Puerto Rican or other Hispanic (5 men, 3 women).

Women comprise 22 percent of the U.S. citizens receiving doctorates in the mathematical sciences, equal to the percentage of U.S. citizen doctorates granted to women over the preceding four years. The numbers of U.S. citizen women receiving doctorates in the mathematical sciences have been quite stable for the last nine years, except for a dip in 1986-87 and 1987-88. The increased percentage of women from the levels of ten or more years ago mainly reflects the decline in the number of U.S. citizen men receiving doctorates. Table 6 presents data for the period 1973-74 through 1989-90.

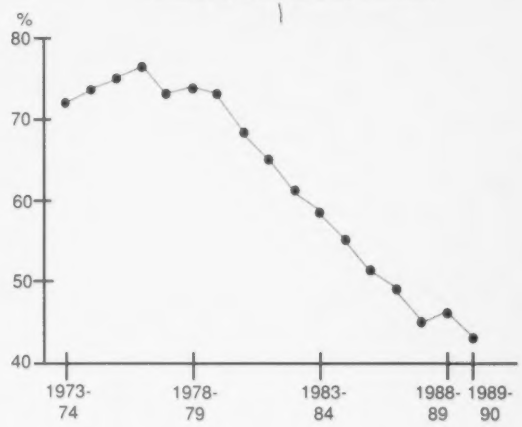
Citizenship and Sex of U.S. Doctorates, 1973 to 1990

Again this year, information is presented on the annual number of doctorates granted by U.S. universities to U.S. citizens since 1973 (Table 5). This number is divided into male and female doctorates (Table 6). In Table 5 the column headed "Adjusted Total of Doctorates given by U.S. Universities" gives the number of doctorates granted between July 1 and June 30 of the indicated years *whose citizenship is known*. Column 2 gives the number who are U.S. citizens and column 3 the percentage that this represents. In Table 6 the number in column 2 of Table 5 is further divided into men and women. Note that in both tables *all years prior to 1982-83* include doctorates granted by computer science departments.

TABLE 5: U.S. Citizen Doctorates

	Adjusted Total of Doctorates given by U.S. universities	Total of Doctorates who are U.S. citizens	%
1973-1974	938	677	72
1974-1975	999	741	74
1975-1976	965	722	75
1976-1977	901	689	76
1977-1978	868	634	73
1978-1979	806	596	74
1979-1980	791	578	73
1980-1981	839	567	68
1981-1982	798	519	65
1982-1983	744	455	61
1983-1984	738	433	59
1984-1985	726	396	55
1985-1986	755	386	51
1986-1987	739	362	49
1987-1988	798	363	45
1988-1989	884	411	46
1989-1990	929	401	43

Graph for Table 5: U.S. Citizen Doctorates
Total of Doctorates by Percent



Graph for Table 5: U.S. Citizen Doctorates

TABLE 6: U.S. Citizen Doctorates, Male and Female

	Doctorates who are U.S. citizens	Male	Female	% Female
1973-1974	677	618	59	9
1974-1975	741	658	83	11
1975-1976	722	636	86	12
1976-1977	689	602	87	13
1977-1978	634	545	89	14
1978-1979	596	503	93	16
1979-1980	578	491	87	15
1980-1981	567	465	102	18
1981-1982	519	431	88	17
1982-1983	455	366	89	20
1983-1984	433	346	87	20
1984-1985	396	315	81	20
1985-1986	386	304	82	21
1986-1987	362	289	73	20
1987-1988	363	287	76	21
1988-1989	411	313	98	24
1989-1990	401	312	89	22

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Salary Survey for New Recipients of Doctorates, 1989-1990

The figures for 1990 were compiled from questionnaires sent to individuals who received a doctorate in the mathematical sciences during the 1989-90 academic year from universities in the United States and Canada.

Questionnaires requesting information on salaries and professional experience were distributed to 820 recipients of degrees using addresses provided by the departments granting the degrees. Of these, 11 were returned by the postal service as undeliverable and could not be forwarded. There were 421 individuals who returned forms between late June and mid-September. The tables below are based on the responses from 367 of these individuals (297 men and 70 women). Data from 54 responses were not used in the compilation of the tables below; forms with insufficient data, or from individuals who indicated they had part-time employment, were not yet employed, or were not seeking employment, were considered unusable.

Readers should be warned that the data in this report are obtained from a self-selected sample and inferences from them may not be representative of the population. For more comprehensive information on the recipients of new doctorates granted last year in the mathematical sciences in the U.S. and Canada, see the preceding article by D. McClure.

Key to Tables. *Salaries* are listed in hundreds of dollars. Nine-month salaries are based on 9-10 months teaching and/or research, not adding extra stipends for summer grants or summer teaching or the equivalent. *Years* listed refer to the academic year in which the doctorate was received. *M* and *F* are Male and Female respectively. *One year experience* means that the persons had experience limited to one year or less in the same position or a position similar to the one reported; some persons receiving a doctorate had been employed in their present position for several years. $(X + Y)$ means there are *X men and Y women* in the 1990 sample. Quartile figures are given only in cases where the number of responses is large enough to make them meaningful.

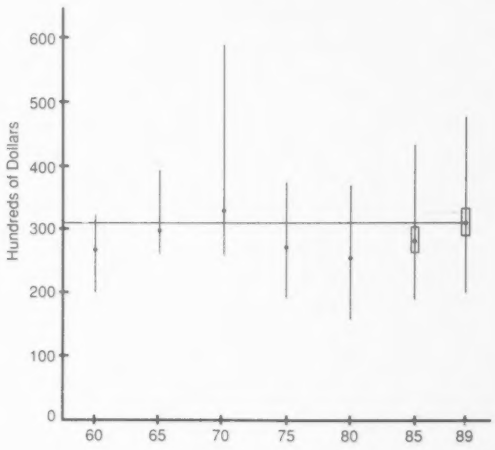
Graphs. The horizontal line represents the median salary for 1989 in hundreds of dollars. The points plotted are the median salaries for each year converted to 1989 dollars using the implicit price deflator prepared annually by the Bureau of Economic Analysis, U.S. Department of Commerce. (Because the deflator is not yet available for this year, the 1990 figures do not appear on the graphs). The boxes show the middle half of the population, where the quartile data are available.

Note that salaries for teaching, or teaching and research, have yet to return to their high point of 1970, although steady progress has been made since 1980. (For further details, see Donald Rung's article, "A Fifteen Year Retrospective on Academic Salaries of U.S. Doctorate Holding Faculty," in the November 1985 issue of *Notices*, pages 772-773.)

Nine-Month Salaries

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 1989 $
TEACHING OR TEACHING AND RESEARCH (187 + 50)						
1960	49		65		80	266
1965	70		80		105	299
1970	85		110		195	331
1975	90	120	128	135	173	273
1980	105	155	171	185	250	252
1985	170	230	250	270	380	283
1986	170	250	269	290	400	298
1987	165	260	280	300	517	301
1988	200	275	293	314	575	305
1989	200	290	310	330	478	310
1990	230	305	320	350	710	
1987M	165	260	280	300	517	
1987F	230	251	280	325	420	
1988M	200	274	290	315	520	
1988F	216	275	299	314	575	
1989M	200	290	305	330	478	
1989F	220	295	310	330	470	
1990M	230	306	320	350	710	
1990F	250	300	325	360	493	
One year experience (169 + 39)						
1990M	230	309	320	350	710	
1990F	250	305	325	360	470	

Nine-Month Teaching



Nine-Month Salaries

Ph.D. Year	Min	Median	Max	Reported Median in 1989 $
		RESEARCH (7 + 0)		
1960	52	65	80	266
1965	71	81	90	303
1970	78	105	160	316
1975	100	—	110	—
1980	125	137	180	202
1985	205	235	250	268
1986	215	245	280	272
1987	250	300	300	322
1988	260	280	385	292
1989	235	270	330	270
1990	230	300	404	—
1987M	250	300	300	
1987F	—	—	—	
1988M	260	280	385	
1988F	—	—	—	
1989M	235	270	330	
1989F	—	—	—	
1990M	230	300	404	
1990F	—	—	—	
One year experience (7 + 0)				
1990M	230	300	404	
1990F	—	—	—	

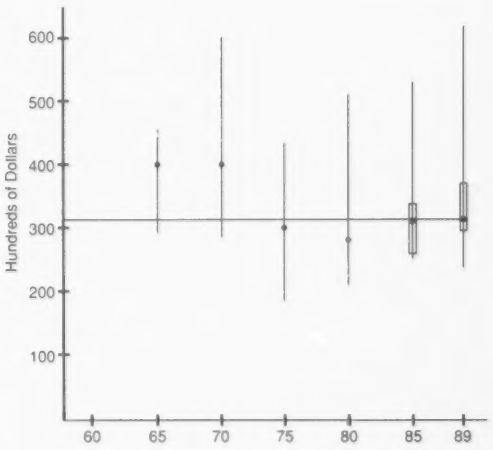
Nine-Month Research

Graph omitted because sample size too small.

Twelve-Month Salaries

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 1989 $
			TEACHING OR TEACHING AND RESEARCH (29 + 6)			
1960	.....		No data		.....	
1965	78		104		121	389
1970	95		128		200	385
1975	87		145		204	309
1980	143		195		350	287
1985	220	230	273	300	470	311
1986	220	265	320	360	480	355
1987	200	283	315	357	520	338
1988	220	313	330	360	480	344
1989	238	290	315	370	620	315
1990	225	318	365	404	670	—
1987M	200	270	300	358	520	
1987F	300	320	339	357	450	
1988M	220	308	330	355	480	
1988F	329	335	350	365	441	
1989M	238	295	315	370	620	
1989F	275	290	314	380	435	
1990M	225	316	360	400	670	
1990F	250	320	383	420	425	
One year experience (24 + 5)						
1990M	225	305	338	404	670	
1990F	250	365	400	420	425	

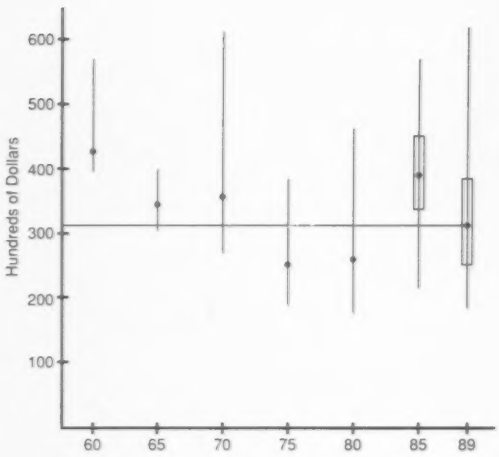
Twelve-Month Teaching



Twelve-Month Salaries

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 1989 $
			RESEARCH (25 + 2)			
1960	97		105		140	429
1965	81		93		107	348
1970	90		120		205	361
1975	90		119		180	254
1980	120		180		321	265
1985	190	295	342	400	520	390
1986	160	240	300	325	510	333
1987	200	260	287	337	430	308
1988	200	245	295	331	505	307
1989	180	250	317	385	623	317
1990	180	280	300	365	546	—
1987M	200	250	282	337	400	
1987F	300	308	316	373	430	
1988M	200	240	280	330	505	
1988F	280	320	330	350	360	
1989M	180	250	300	393	623	
1989F	200	295	350	373	400	
1990M	180	280	300	360	546	
1990F	330	330	365	400	400	
One year experience (22 + 2)						
1990M	180	280	300	360	546	
1990F	330	330	365	400	400	

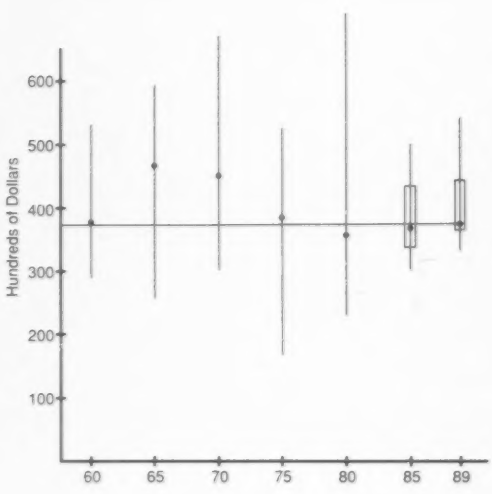
Twelve-Month Research



Twelve-Month Salaries

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 1989 $
			GOVERNMENT (10 + 3)			
1960	72		93		130	380
1965	70		126		160	471
1970	100		150		223	451
1975	78		182		247	388
1980	156		244		501	360
1985	263	294	325	381	440	370
1986	270	330	400	449	610	444
1987	200	290	360	465	500	386
1988	240	298	343	405	436	357
1989	330	363	378	438	540	378
1990	320	345	378	430	587	—
1987M	200	290	360	465	500	
1987F	—	—	—	—	—	
1988M	240	290	332	360	436	
1988F	380	380	405	430	430	
1989M	330	363	378	438	540	
1989F	—	—	—	—	—	
1990M	320	345	375	430	587	
1990F	330	354	378	429	480	
One year experience (8 + 3)						
1990M	320	338	350	429	587	
1990F	330	354	378	429	480	

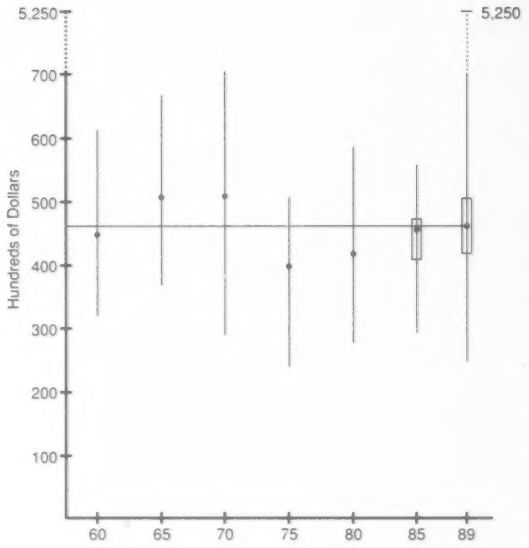
Twelve-Month Government



Twelve-Month Salaries

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 1989 $
BUSINESS AND INDUSTRY (39 + 9)						
1960	78		110		150	450
1965	100		136		180	508
1970	96		170		235	511
1975	114		187		240	398
1980	190		284		400	419
1985	260	360	400	420	493	456
1986	324	373	425	477	750	471
1987	290	400	451	500	1500	484
1988	300	400	440	490	1100	458
1989	250	420	464	505	5250	464
1990	320	438	495	533	700	
1987M	290	400	465	517	1500	
1987F	300	394	424	466	502	
1988M	300	400	431	490	1100	
1988F	375	437	454	495	660	
1989M	250	420	464	513	5250	
1989F	375	430	470	500	516	
1990M	320	443	490	533	630	
1990F	390	440	500	525	700	
One year experience (24 + 4)						
1990M	320	430	470	513	622	
1990F	420	430	465	495	500	

Twelve-Month Industry



1990 CBMS Survey

Questionnaires for the 1990 Survey of Undergraduate Programs in the Mathematical Sciences and Computer Science, conducted by the Conference Board of the Mathematical Sciences and funded by NSF, were mailed in fall to selected departments. Donald C. Rung, director of the 1990 CBMS Survey, expects to have preliminary results in spring 1991. Survey reports will be published as quickly as possible, and copies will be available from the Mathematical Association of America.

In addition to the usual detailed enrollment and faculty profile data, the 1990 CBMS Survey contains questions on both the undergraduate major in the mathematical sciences and mathematical sciences libraries.

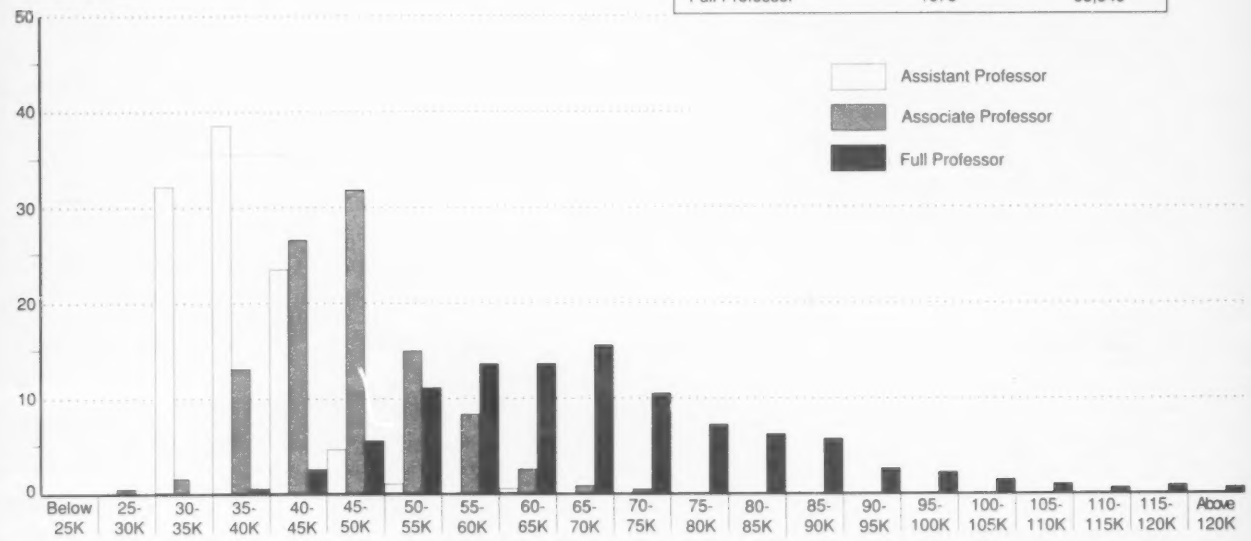
Although the deadline for survey returns was November 1, 1990, late returns will be accepted. Departments in the sample who have not yet responded are urged to complete and return their questionnaires as soon as possible to: CBMS Survey, Attn: Monica Foulkes, AMS, P.O. Box 6248, Providence, RI 02940-6248.

Faculty Salary Survey 1990-1991

The charts on the following pages display faculty salary data for Groups I-VI, M and B: faculty salaries by rank, mean salaries by rank, the number of faculty within that rank, and the number of usable returns for the group. Departments were asked to report the number of faculty whose 1990-91 academic-year salaries fell within given salary intervals.

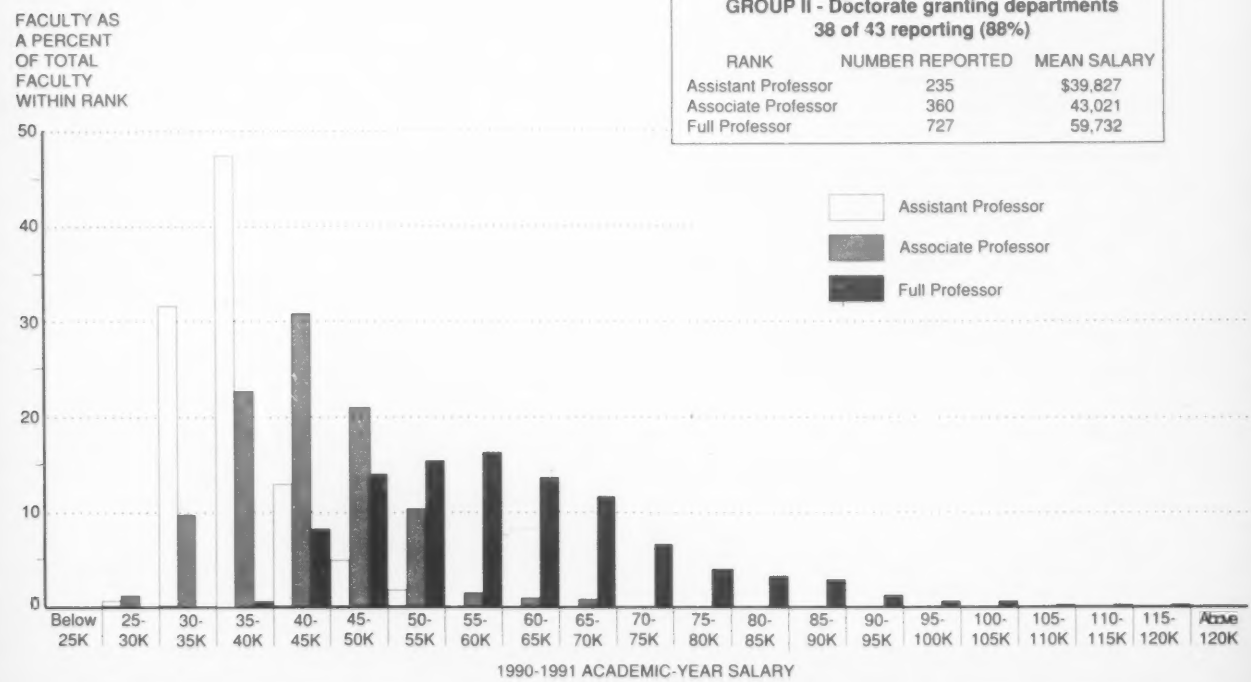
FACULTY SALARIES 1990-91
GROUP I - Doctorate granting departments
33 of 39 reporting (85%)

RANK	NUMBER REPORTED	MEAN SALARY
Assistant Professor	186	$37,883
Associate Professor	267	47,354
Full Professor	1075	68,549



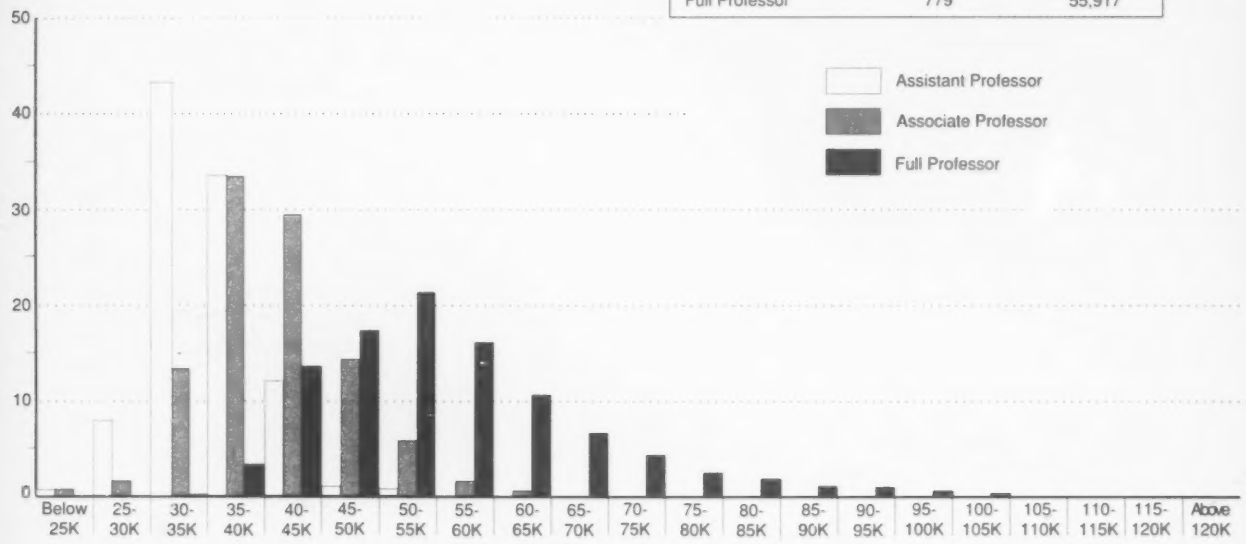
FACULTY SALARIES 1990-91
GROUP II - Doctorate granting departments
38 of 43 reporting (88%)

RANK	NUMBER REPORTED	MEAN SALARY
Assistant Professor	235	$39,827
Associate Professor	360	43,021
Full Professor	727	59,732



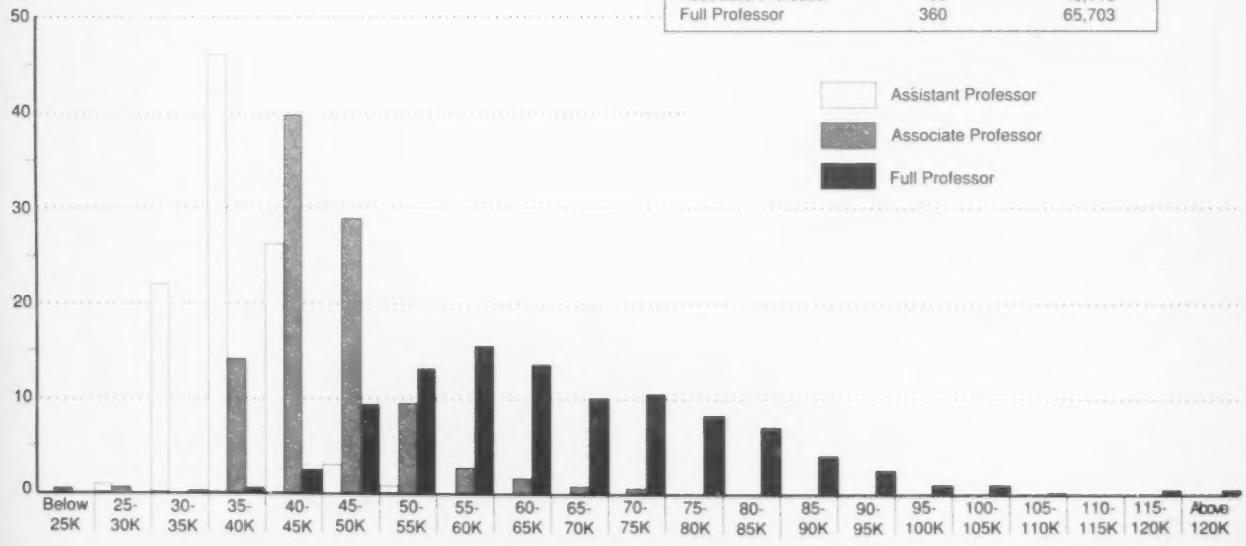
FACULTY SALARIES 1990-91
GROUP III - Doctorate granting departments
72 of 86 reporting (84%)

RANK	NUMBER REPORTED	MEAN SALARY
Assistant Professor	460	$34,977
Associate Professor	522	40,737
Full Professor	779	55,917



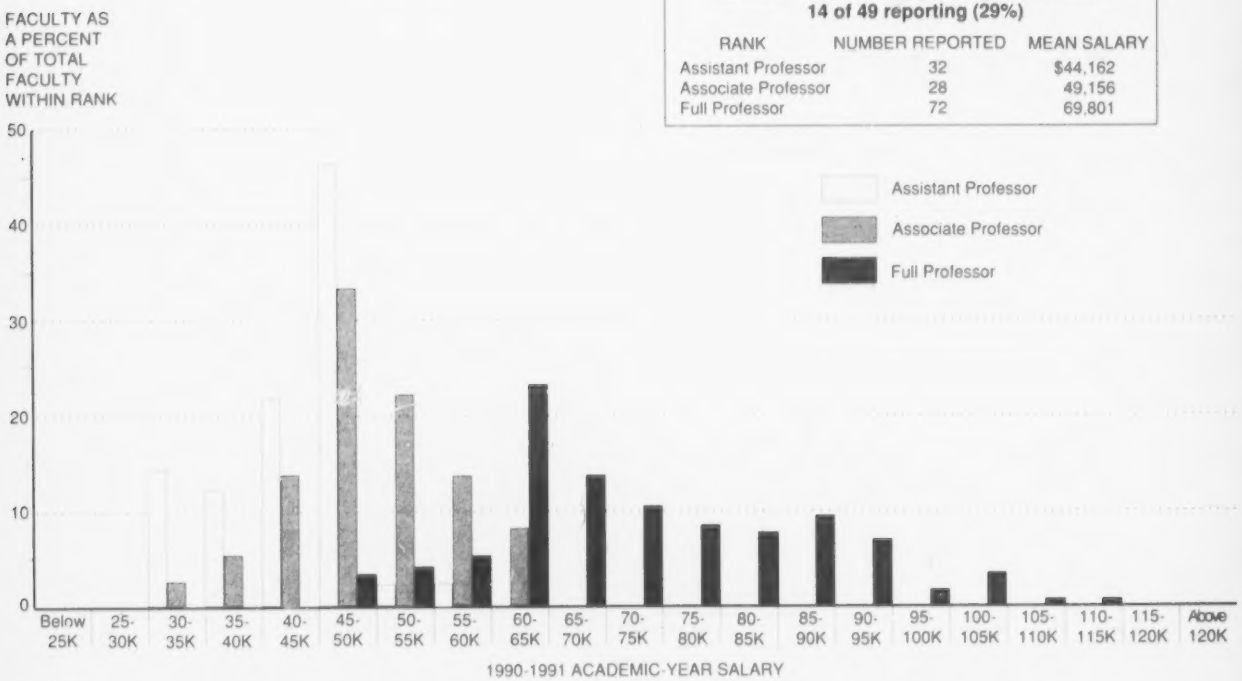
FACULTY SALARIES 1990-91
GROUP IV - Doctorate granting departments
50 of 74 reporting (68%)

RANK	NUMBER REPORTED	MEAN SALARY
Assistant Professor	162	$35,883
Associate Professor	158	45,118
Full Professor	360	65,703



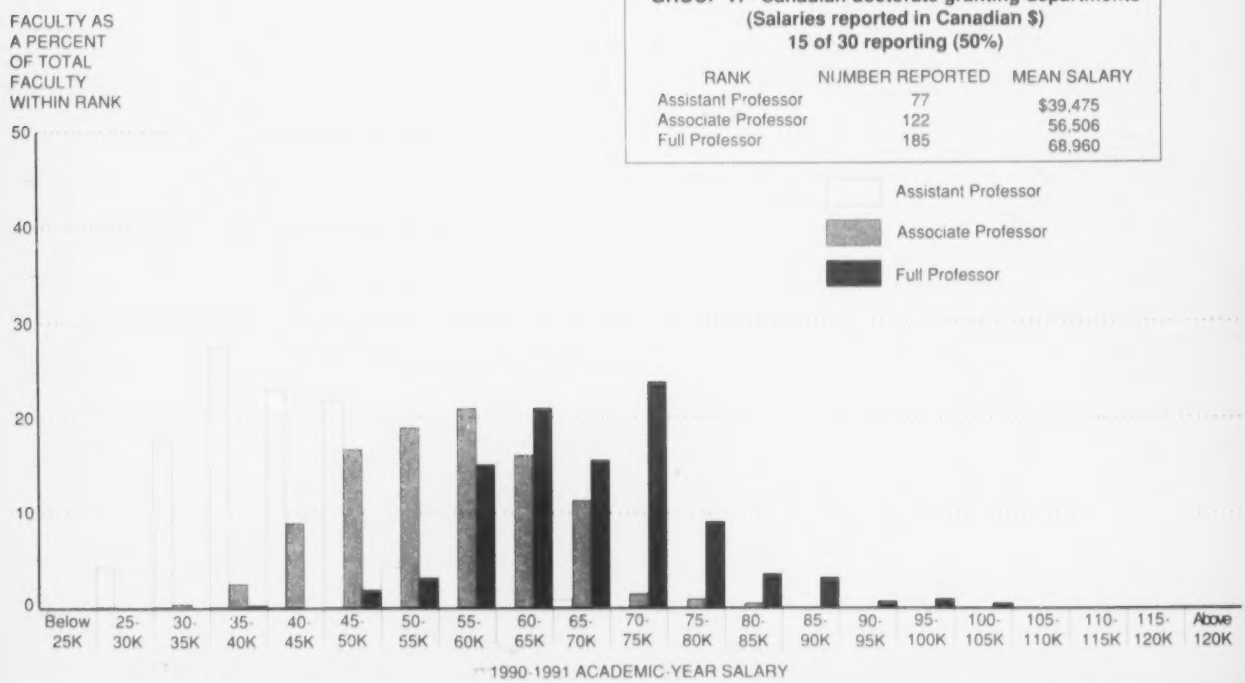
FACULTY SALARIES 1990-91
GROUP V - Doctorate granting departments
14 of 49 reporting (29%)

RANK	NUMBER REPORTED	MEAN SALARY
Assistant Professor	32	$44,162
Associate Professor	28	49,156
Full Professor	72	69,801



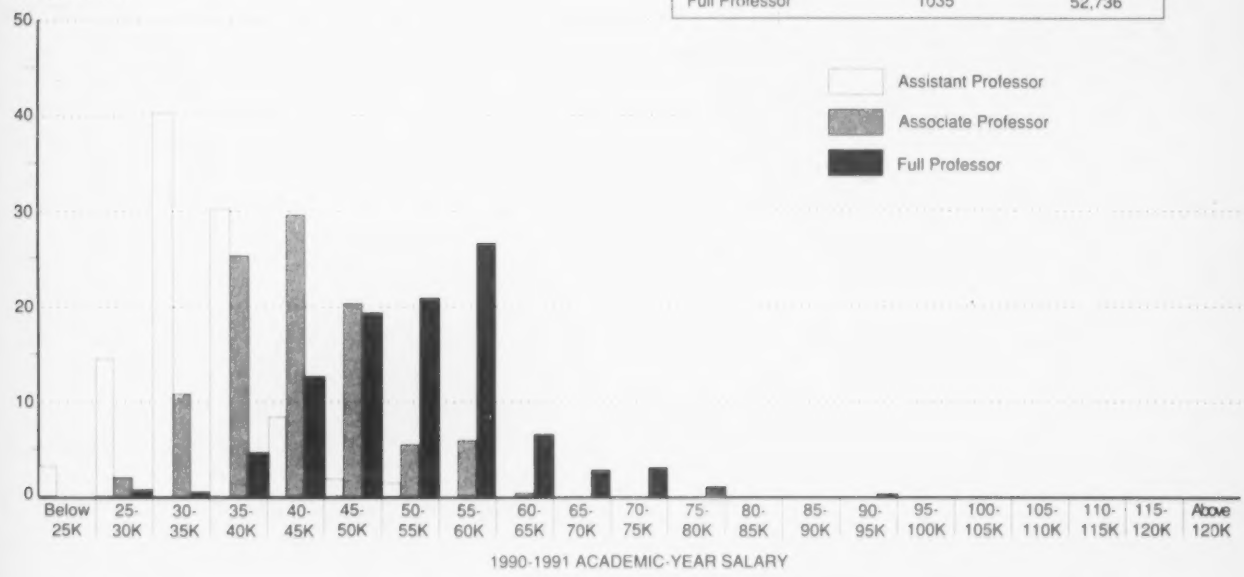
FACULTY SALARIES 1990-91
GROUP VI - Canadian doctorate granting departments
(Salaries reported in Canadian $)
15 of 30 reporting (50%)

RANK	NUMBER REPORTED	MEAN SALARY
Assistant Professor	77	$39,475
Associate Professor	122	56,506
Full Professor	185	68,960



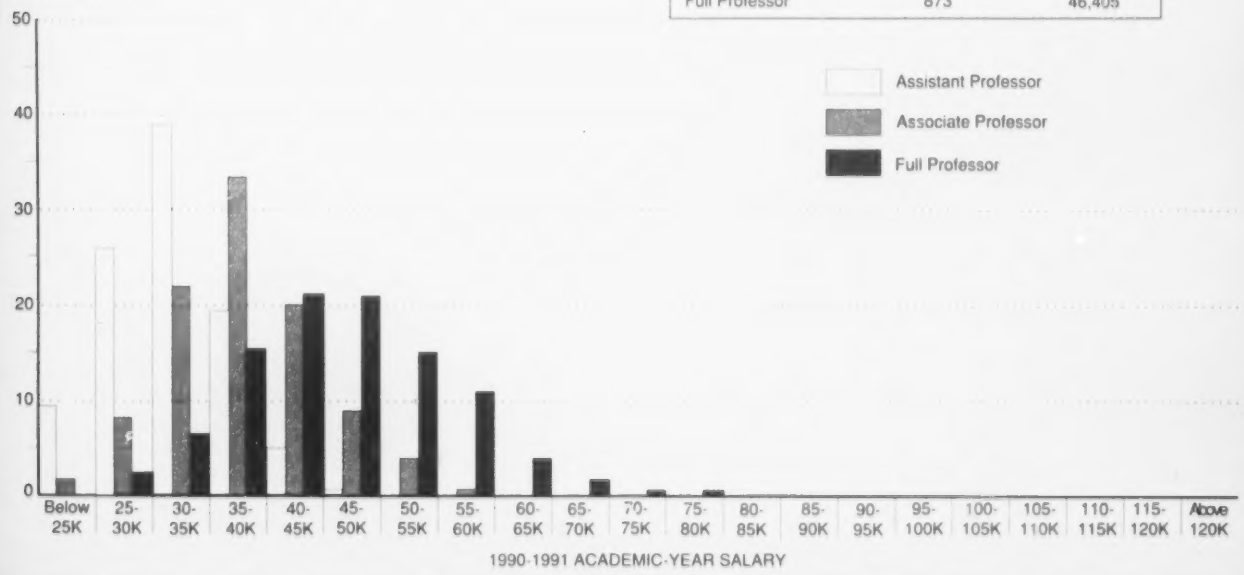
FACULTY SALARIES 1990-91
GROUP M - Master's degree granting departments
163 of 263 reporting (62%)

RANK	NUMBER REPORTED	MEAN SALARY
Assistant Professor	873	$34,517
Associate Professor	968	41,920
Full Professor	1035	52,736



FACULTY SALARIES 1990-91
GROUP B - Bachelor's degree granting departments
456 of 975 reporting (47%)

RANK	NUMBER REPORTED	MEAN SALARY
Assistant Professor	1012	$31,579
Associate Professor	932	38,066
Full Professor	873	46,405



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NOTICES
OF THE
AMERICAN MATHEMATICAL SOCIETY

1990 Annual AMS-MAA Survey

(Second Report)

Enrollments, Faculty Characteristics, and
Update on New Doctorates, Fall 1990

Donald E. McClure

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1990 Annual AMS-MAA Survey

(*Second Report*)

Enrollments, Faculty Characteristics, and Update on New Doctorates, Fall 1990

Donald E. McClure

This is the second report of the 1990 Survey. A first report appeared in the November 1990 *Notices*, pages 1217–1250. It included a report on the 1989–1990 new doctorates, starting salaries, faculty salaries, and a list of names and thesis titles of the 1989–1990 doctorates. A supplementary list of 1989–1990 doctorates appears in this issue of *Notices*.

The 1990 Annual AMS-MAA Survey represents the thirty-fourth in an annual series begun in 1957 by the Society. The 1990 Survey was under the direction of the AMS-MAA Data Committee whose members are: Edward A. Connors, Lincoln K. Durst (consultant), John D. Fulton, James F. Hurley, Charlotte Lin, Don O. Loftsgaarden, David J. Lutzer, James W. Maxwell (ex officio), Donald E. McClure (chair), and Donald C. Rung. Comments or suggestions regarding the Annual Survey may be directed to members of the AMS-MAA Data Committee.

For these reports, departments are divided into groups according to the highest degree offered in the mathematical sciences:

Groups I and II include the leading departments of mathematics in the U.S. according to the 1982 assessment of Research-Doctorate Programs conducted by the Conference Board of Associated Research Councils in which departments were rated according to the quality of their graduate faculty.[1]

Group I is composed of 39 departments with scores in the 3.0–5.0 range.

Group II is composed of 43 departments with scores in the 2.0–2.9 range.

Group III contains the remaining U.S. departments reporting a doctoral program.

Group IV contains U.S. departments (or programs) of statistics, biostatistics and biometrics reporting a doctoral program.

Group V contains U.S. departments (or programs) in applied mathematics/applied science, operations research and management science which report a doctoral program.

Group Va is applied mathematics/applied science; **Group Vb** is operations research and management science.

Group VI contains doctorate-granting departments (or programs) in the mathematical sciences in Canadian universities.

Group M contains U.S. departments granting a master's degree as the highest graduate degree.

Group B contains U.S. departments granting a baccalaureate degree only.

[1]These findings were published in *An Assessment of Research-Doctorate Programs in the United States: Mathematical and Physical Sciences*, edited by Lyle V. Jones, Gardner Lindzey, and Porter E. Coggeshall, National Academy Press, Washington, D.C., 1982. The information on mathematics, statistics and computer science was presented in digest form in the April 1983 issue of *Notices*, pages 257-267, and an analysis of the above classifications was given in the June 1983 *Notices*, pages 392-393. For a listing of departments in Groups I and II see the April 1988 *Notices*, pages 532-533.

Highlights

- The final (spring) count of new doctorates shows a total of 950 doctorates in the mathematical sciences awarded by U.S. institutions in the period July 1, 1989 through June 30, 1990. This is the largest number since 1975–1976 and is 24% higher than the 1984–1985 final count.

- The final count shows 410 U.S. citizens among the 947 doctoral recipients whose citizenship status is known. This is the second highest total number of U.S. citizens in the past six years, but the percentage (43%) is a historical low for the seventeen years in which citizenship status has been followed in the Annual Survey.

- A total of 537 non-U.S. citizens were awarded doctorates in 1989–1990. This is the largest number ever reported and represents an increase of 148% over the number of non-citizen new doctorates ten years earlier.

- The percentage of U.S. citizens among all graduate students, including master's degree candidates and special students, in U.S. doctorate-granting mathematics departments is 56%, substantially higher than the percentage they represent among new doctorates.

- In the final count there were 90 women (22%) among the 410 U.S. citizen new doctorates. Among non-U.S. citizens, women represent 15% of the new doctorates. These percentages are substantially lower than the ones for earlier stages of the mathematics education pipeline. Among all U.S. citizen graduate students in U.S. mathematical sciences departments, women constitute 36% of the total. At the undergraduate level, 43% of junior/senior mathematical sciences majors are women.

- Out of the 943 new doctorates (from U.S. or Canadian institutions) whose employment status is known, 60% are employed in academic positions in the U.S., 16% are employed in nonacademic positions in the U.S., and 20% are employed outside the U.S. Only 2% are reported as not yet employed, and the remainder are not seeking employment.

I. Introduction

The Annual AMS-MAA Survey collects information each year about departments, faculties and students in the mathematical sciences in the United States and Canada. This article reports results from two parts of the 1990 Annual AMS-MAA Survey. First, we update information about new doctorates reported earlier in the November 1990 issue of *Notices* (see pages 1217–1221). Second, we present summaries of results about characteristics of faculties and of instructional programs at the undergraduate and graduate levels.

The Second Report is patterned after previous years' reports in the interest of continuity and to make year-to-year comparisons possible. Some new types of information are reported, however, and the AMS-MAA Data Committee continues to welcome suggestions from the mathematics community concerning other types of information or reporting about the mathematics scene which members of the profession would find to be of interest.

In the 1990 Annual Survey, new information was requested from departments about faculty hiring and about different categories of faculty positions. Traditionally, the Annual Survey has done a detailed analysis of the employment status of new doctorates broken down by the field of their thesis. In the 1990 survey we added questions about the demand side of the employment market, in particular about the availability of openings in the academic job market. At the time that these questions were added to the survey, considerable attention was being given in the scientific press to projected shortages of trained scientists during the next decade. The new information collected in this area is intended to provide a baseline for comparison of changing demand in the future. It will also provide some basis for understanding recent perturbations of the academic job market.

New questions were also added to the survey in 1990 to enable a finer breakdown in the analysis of nontenured faculty ranks.

A more comprehensive and penetrating reporting of information about faculty populations and instructional programs in mathematics and the mathematical sciences will be contained in the forthcoming report on the 1990 Survey of Undergraduate Programs in the Mathematical Sciences and Computer Science, conducted by the Conference Board on Mathematical Sciences (CBMS).

II. Update on the 1989–1990 New Doctorates

Information about new doctorates awarded between July 1, 1989 and June 30, 1990 was collected from doctorate-granting departments in late spring 1990 and from a follow-up census of individual degree recipients. The First Report of the 1990 Annual Survey (November 1990 issue of *Notices*, pages 1217–1230) presents the survey results obtained about new doctorates up to the time of that report. Here we update the earlier figures on the basis of more complete returns.

Table 1: New Doctorates, Fall and Spring Counts

	85–86		86–87		87–88		88–89		89–90	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
U.S.	756	782	779	808	804	828	905	919	933	950
Canada	45	45	66	66	52	55	53	62	58	59
Total	801	827	845	874	856	883	958	981	991	1009

The spring count of new doctorates (Table 1) shows a total of 950 doctorates in mathematical sciences awarded by U.S. institutions and 59 awarded by Canadian institutions. The final count for U.S. institutions is a 3% increase from the previous year and is the highest number reported since 1975–1976.

Citizenship status is known for 947 of the new doctorates awarded by U.S. institutions. The total of 410 U.S. citizens is marginally lower than last year's spring count of 419, but still is the second highest figure since 1983–1984. The percentage of U.S. citizens (43%) is an all-time low.

The number of non-U.S. citizen new doctorates has risen steadily since 1978–1979. The final spring count shows 537 non-U.S. citizens, representing an increase of 148% from the count in 1979–1980. In the same ten-year period the number of U.S. citizen new doctorates has decreased by more than 30%.

Among the U.S. citizens, the final tally shows 90 women and 320 men. The percentage of women (22%) among the U.S. citizens is substantially higher than the percentage (15%) among non-U.S. citizens.

Employment data for new doctorates, broken down by the field of their thesis research, are updated in Tables 2A and 2B (see next page). The employment matrices report the status of the 991 new doctorates included in the fall count; employment status is known for 943. Overall, the majority (60%) of new doctorates assumed academic positions in the U.S. The percentage assuming academic positions, regardless of country, is 77%. The proportions assuming academic vs. nonacademic positions vary greatly with the field of the thesis. For example, in probability and statistics, which includes over 200 doctoral recipients from statistics graduate programs, 47% of those whose employment status is known took academic positions in the U.S.

The updated matrix shows 19 new doctorates (2%) still seeking employment. This figure does not include non-U.S. citizens who are known to have returned to their country of origin and who may be still seeking employment outside the U.S. At the same time a year ago, 3% of the 1988–1989 new doctorates were reported as still seeking employment.

Finally, we note that the names of the 1989–1990 new doctorates and their thesis titles were published in *Notices* (November 1990 and a supplemental list in this issue).

Table 2A: Employment Status of 1989–1990 New Doctorates in the Mathematical Sciences

Type of Employer	Algebra or Number Theory	Real or Complex Analysis	Geometry or Topology	Logic	Probability or Statistics	Applied Mathematics	Discrete Math or Combinatorics	Numerical Analysis	Linear or Nonlinear Optimization	Other	TOTAL
Group I	19	28	39	2	2	4	4	4		2	104
Group II	13	7	8		3	11	6	2		1	51
Group III	7	6	10	3	10	18	4	5	2	2	67
Group IV					31				1		32
Group V					4	9	2		1	2	18
Masters	12	12	11	3	22	12	6	1	2	3	84
Bachelors	23	12	12	6	17	21	10	2		4	107
Two-year Colleges	1	1	2		1	3		1		1	10
Other Academic Departments	7	5	4		37	19	2	3	5	8	90
Research Institutes	2	3	7		7	8	1	1	1	2	32
Government	1	2			9	4			1	2	19
Business and Industry	2	6	2	2	54	17	4	7	2	7	103
Canada, Academic	7	3	2	2	9	7	6	1	2	2	41
Canada, Nonacademic	1	1			5	2	1		1	1	12
Foreign, Academic	9	18	13	4	42	18	5	3	2	8	122
Foreign, Nonacademic	2		2		7	2			1	1	15
Not seeking employment	1	1	1		6	3	1	2	1	1	17
Not yet employed	2	3	3	1	4	4	1		1		19
Unknown (U.S.)		2	1		2	3	2		1	3	14
Unknown (non-U.S.)*	5	4		2	10	6	2	3	2		34
Total	114	114	117	25	282	171	57	35	26	50	991

*Non-U.S. citizens who returned to their country of citizenship and whose status is reported as "unknown" or "still seeking employment"

Table 2B: Employment Status of 1989–1990 New Doctorates in the Mathematical Sciences Females Only

Type of Employer	Algebra or Number Theory	Real or Complex Analysis	Geometry or Topology	Logic	Probability or Statistics	Applied Mathematics	Discrete Math or Combinatorics	Numerical Analysis	Linear or Nonlinear Optimization	Other	TOTAL
Group I	1	2	7			1	1				12
Group II	3		2		2		1				8
Group III	1	1	2			5		2	1	1	13
Group IV					10						10
Group V					1		1			2	4
Masters		2	2	1	3	2	4			2	16
Bachelors	3	2	5	1	2	4				2	19
Two-year Colleges					1	1		1		1	4
Other Academic Departments	3				12	6				3	24
Research Institutes					2					1	3
Government					2						2
Business and Industry		1			11	5		2		1	20
Canada, Academic	2			1	3	1	1				8
Canada, Nonacademic		1			2						3
Foreign, Academic	4	2	1	1	5	2					15
Foreign, Nonacademic											
Not seeking employment			1		3	2	1	2		1	10
Not yet employed			1		2	1					4
Unknown (U.S.)						2				1	3
Unknown (non-U.S.)*		1			1	2		1			5
Total	17	12	21	4	62	34	9	8	1	15	183

*Non-U.S. citizens who returned to their country of citizenship and whose status is reported as "unknown" or "still seeking employment".

III. Faculty Characteristics

Information about faculty members and instructional programs was collected from mathematical sciences departments in the fall 1990 Departmental Profile Survey. The First Report contained information collected earlier about faculty salaries.

Table 3A shows attrition due to deaths and retirements of faculty in mathematical sciences. For Groups I, II and III combined, the rate is the same as last year. The attrition rates for faculty from Group B and Group VI are curiously higher than the others. The demographic profile of faculty in the Second Report of the 1989 Annual Survey (July/August 1990 issue of *Notices*, pages 659–662) showed that 15% of Group B faculty and 22% of Group VI faculty are age 55 or older compared to 19% for all groups combined.

Table 3B reports the new information on numbers of full-time faculty positions which departments attempted to fill with doctorates during 1989–1990. These data must be interpreted cautiously since the response rate is less than 100%. The response rate varies by group, and any attempt to project totals from the raw data may be affected by selection biases. Among doctoral new hires, women constitute 15% of the total in Groups I, II and III combined and 21% in Groups M and B combined.

Tables 3C and 3D (see next page) report percentages of women among different types of full-time faculty. This year's survey collected more detailed information about nontenured ranks in order to be able to analyze the subpopulation of full-time faculty members whose positions are not tenure-eligible. Such positions include, for example, postdoctoral fellows, research positions, and some instructorships and lectureships. In Groups I, II and III combined, the non tenure-eligible positions account for 7% of the doctoral faculty and 9.5% of all full-time faculty. In Groups M and B combined, the non tenure-eligible faculty members account for 4% of the doctoral faculty and 14% of all full-time faculty.

Table 3C reports the percentages of women by group and tenure status for faculty who have a doctorate. Table 3D reports the corresponding survey results for all full-time faculty. In the latter analysis, which includes the non-doctoral faculty, the percentage of women among non tenure-eligible faculty is substantially higher than the corresponding percentages either among doctoral faculty or among tenure-eligible ranks.

Tables 3E and 3F (see next page) report changes in sizes of nontenured and tenured faculty populations by group and by sex. Overall, the sizes of the tenured and nontenured populations increased, with the subpopulations of women showing substantially greater increases than the subpopulations of men.

Table 3A. Faculty Attrition*

	GROUPS								
	I	II	III	I+II+III	IV	V	M	B	VI
% of full-time faculty	1.1	1.3	1.8	1.4	1.4	0.5	1.8	2.4	2.7

*Percentage of full-time faculty who were in the department in fall 1989 but were reported to have retired or died by fall 1990.

Table 3B. Faculty Recruitment

	GROUPS								
	I	II	III	I+II+III	IV	V	M	B	VI
Number of open positions*	169	87	195	451	89	21	281	316	50
Doctoral hires, male	125	62	131	318	53	15	166	176	42
Doctoral hires, female	19	12	26	57	15	3	49	44	4
Nondoctoral hires, male	1	0	4	5	1	0	29	57	0
Nondoctoral hires, female	0	2	2	4	2	0	28	47	0
Number of unfilled positions	24	17	32	73	18	2	46	42	4
Response rate by group**	85%	86%	84%	85%	74%	33%	59%	49%	63%

* Number of positions under recruitment in 1989–1990 to be filled for 1990–1991.

**The proportion of usable returns varies for different sections of the Departmental Profile Survey. The response rates reported here apply to the recruitment data only.

Table 3C. Percentage of Women among Doctoral Full-time Faculty, Fall 1990

	GROUPS								
	I	II	III	I+II+III	IV	V	M	B	VI
% of all doctoral faculty	6.0	6.5	8.8	7.1	13.3	7.9	13.8	17.2	6.3
% of tenured doctoral faculty	4.5	5.1	5.7	5.1	6.3	7.7	10.4	13.3	3.7
% of untenured, tenure-eligible doctoral faculty	10.2	11.4	17.0	14.0	29.5	6.7	20.9	24.3	19.1
% of non tenure-eligible doctoral faculty	11.6	14.6	13.0	12.3	24.4	13.3	27.7	26.2	13.8

Table 3D. Percentage of Women among All Full-time Faculty, Fall 1990

	GROUPS								
	I	II	III	I+II+III	IV	V	M	B	VI
% of all full-time faculty	6.6	9.3	13.3	9.8	14.1	7.7	21.6	24.6	6.4
% of non tenure-eligible faculty	15.5	50.0	48.0	33.7	27.1	11.8	55.7	44.7	14.0

Table 3E. Faculty Size
Percentage Change in Doctoral Nontenured Faculty, Fall 1989 to Fall 1990

	GROUPS								
	I	II	III	I+II+III	IV	V	M	B	VI
Male	2.6	8.6	2.2	3.9	1.1	5.8	0.4	6.2	7.8
Female	33.3	–15.0	17.4	12.0	25.4	0.0	9.2	9.6	–12.5
Total	5.3	5.1	4.4	4.9	6.9	5.3	2.1	7.0	3.5

Table 3F. Faculty Size
Percentage Change in Doctoral Tenured Faculty, Fall 1989 to Fall 1990

	GROUPS								
	I	II	III	I+II+III	IV	V	M	B	VI
Male	–0.1	0.8	0.9	0.5	3.2	4.8	0.1	2.2	7.5
Female	5.0	13.2	3.0	6.7	3.0	37.5	6.0	6.7	17.6
Total	0.1	1.4	1.0	0.8	3.2	6.8	0.7	2.8	7.8

IV. Undergraduate Enrollment Profile and Majors

Data on undergraduate enrollments and majors are summarized in Tables 4A through 4E. The year-to-year percentage changes given in Tables 4A and 4D are based on responses obtained on the 1990 Departmental Profile Survey form alone and are not affected by differential response rates from one year to the next.

Survey results about class sizes were last reported three years ago, for the 1987 Annual Survey. There are no striking changes from 1987 to the present results shown in Table 4C.

Every five years, the CBMS Survey has collected and analyzed more detailed information about enrollment patterns, curricular trends, and other information pertaining to mathematics instructional programs. We alert readers to a report which is now in preparation for the 1990 CBMS Survey.

Table 4A. Percentage Change in Undergraduate Enrollments, Fall 1989 to Fall 1990

	GROUPS							
	I	II	III	IV	V	M	B	VI
% change	–0.1	–3.9	0.1	1.7	–1.5	0.3	1.3	1.8
Response rate by group*	90%	84%	79%	66%	28%	55%	46%	70%

*The proportion of usable returns varies for different sections of the Departmental Profile Survey. The response rates reported here apply to Tables 4A through 4C on undergraduate enrollments.

Table 4B. Distribution of Undergraduate Enrollments, Fall 1990

	GROUPS							
COURSES	I	II	III	I+II+III	M	B	M+B	VI
Remedial mathematics*, %	10.0	6.4	12.2	10.0	16.2	17.2	16.7	1.8
Remedial math + pre-calculus, %	24.8	26.8	38.6	31.4	32.6	32.3	32.5	3.4
Remedial math + pre-calculus + calculus, %	57.9	59.0	60.7	59.4	47.1	46.9	47.0	34.0

*Arithmetic, high school algebra, geometry.

Table 4C. Average Class Size, Fall 1990

	GROUPS							
COURSES	I	II	III	IV	V	M	B	VI
Remedial mathematics*	32	34	41		19	35	28	62
Traditional pre-calculus	32	39	43			37	29	99
First-year calculus	35	44	38			31	25	69
Undergraduate statistics	37	44	36	44	50	33	27	42
Undergraduate computer science	30	25	19	35	42	23	18	33
Other undergraduate mathematics, majors	29	31	26			22	16	36
Other undergraduate mathematics, nonmajors	36	34	39			34	27	51
Graduate courses	10	10	8	15	17	11	12	4
All courses	30	34	33	32	27	29	23	42

*Arithmetic, high school algebra, geometry.

Table 4D. Percentage Change in Junior/Senior Majors, Fall 1989 to Fall 1990

	GROUPS							
	I	II	III	IV	V	M	B	VI
% change	5.6	–5.9	–3.9	10.5	–7.7	2.3	3.9	4.1

Table 4E. Percentage of Women among Junior/Senior Majors, Fall 1990

	GROUPS							
	I	II	III	IV	V	M	B	VI
% of departmental majors	37.9	40.8	42.3	42.1	30.3	45.5	44.1	30.4

V. Graduate Student Profile

Survey results about characteristics of graduate students are summarized in Tables 5A through 5C.

In comparison with last year's Second Report on the 1989 Annual Survey, we note that Groups I and IV, which report substantial increases in the number of first-year graduate students in fall 1990, are the same groups reporting substantial decreases in fall 1989 (Table 5A). At the same time, the groups (II and III) that reported substantial increases in fall 1989 are the same ones showing moderate declines in numbers of first-year students in fall 1990.

Except for Group I, the percentage of women among U.S. citizen graduate students is substantially higher than the overall percentage of women among U.S. citizen new doctorates (Table 5B).

A similar dichotomy stands out in the summary of citizenship status for full-time graduate students (Table 5C). The percentage of U.S. citizens among full-time graduate students is substantially higher in Groups I, II, III and IV than their percentage among new doctorates.

Table 5A. Percentage Change in Number of Graduate Students, Fall 1989 to Fall 1990

	GROUPS						
	I	II	III	IV	V	M	VI
First-year students	8.1	–0.8	–5.4	14.5	–13.7	4.3	–10.8
All years	4.9	5.4	4.0	1.5	–3.3	15.8	4.8
Response rate by group*	87%	72%	67%	59%	28%	47%	60%

* The proportion of usable forms varies for different sections of the Departmental Profile Survey. The response rates reported here apply to Tables 5A through 5C on graduate student enrollments.

Table 5B. Percentage of U.S. Citizen Women among U.S. Citizen Graduate Students, Fall 1990

	GROUPS					
	I	II	III	IV	V	M
% of first-year students	26.9	35.3	40.1	41.5	36.1	48.6
% of all years	23.0	34.0	37.3	40.4	26.2	45.4

Table 5C. Percentage of U.S. Citizen Graduate Students, Fall 1990

	GROUPS					
	I	II	III	IV	V	M
% of first-year students	55.4	63.4	62.0	51.2	48.4	74.7
% of all years	52.4	56.4	57.9	46.5	44.3	73.9

Acknowledgment

The Annual AMS-MAA Survey attempts to provide an accurate appraisal and analysis of various aspects of the academic mathematical scene vital to the entire mathematical community. Yearly, collegiate departments in the United States, and the doctorate-granting departments in Canada, are provided the opportunity to respond. The quantity and quality of the responses directly determine the quality of the information in these reports. Without the dedicated cooperation of the secretarial and administrative support staff in the mathematical science departments we would not be able to conduct a survey, nor be confident in our analysis of its results. We are, unfortunately, unable to thank personally all the departmental assistants for their cooperation, but it is nonetheless appreciated. However, we are able to thank the administrative support staff of the AMS, especially Marcia Almeida, Monica Foulkes, and James W. Maxwell, whose efforts are acknowledged and appreciated.

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Doctoral Degrees Conferred 1989–1990

Supplementary List

The following list supplements the list of thesis titles published in the November 1990 issue of *Notices*. Each entry contains the name of the recipient and the thesis title. The number in parentheses following the name of the university is the number of degrees granted by the department.

CALIFORNIA

University of Southern California (5)

MATHEMATICS

Bauer, Maximilian, *Example of pseudo-Anosov homeomorphisms.*

Jaekel, Tauno, *Stochastic flow with a singular vortex.*

Morris, Pricilla Jean, *On a class of homogeneous stochastic flows.*

Neubauer, Michael G., *On solvable monodromy groups of fixed genus.*

Spieler, Gisela, *Parameter estimation by system theoretic methods.*

COLORADO

University of Denver (1)

MATHEMATICS AND COMPUTER SCIENCE

Marrannes-Marbeau, Jocelyne Helene, *Analysis of a discrete quantum probability model.*

KANSAS

Kansas State University (1)

STATISTICS

Crabb, Jeffrey, *A SAS program to correct the analysis of unbalanced two-way split-plot designs.*

MINNESOTA

University of Minnesota, Minneapolis (4)

STATISTICS

Adams, John, *Evaluating regression strategies.*

Bian, Guorui, *Bayesian statistical analysis with independent bivariate priors for the normal location and scale parameters.*

Kang, Chang Wook, *Generalization of the diagnostic methods of recursive residuals.*

Wong, Weng Kee, *Heteroscedastic optimal design.*

MONTANA

Montana State University (2)

MATHEMATICAL SCIENCES

Doyle, Randall Ross, *Extensions to the development of the sine-Galerkin method for parabolic problems.*

Lewis, David Lamar, *A fully Galerkin method for parabolic problems.*

NEW YORK

Polytechnic University (4)

MATHEMATICS

Bershatsky, Eugene, *The development of confidence bounds for a sales forecast.*

Chau, Jack-Kang, *Normal lattices and measures.*

Hertzlinger, Joseph, *Normality and similar properties in lattices.*

Schutz, Robert W., *On regular lattice measures.*

CANADA

University of Calgary (1)

MATHEMATICS AND STATISTICS

Ye, Qiang, *Symmetric matrix pencils.*

Errata

The thesis title for Mark R. Purtill (Mathematics, Massachusetts Institute of Technology) was incorrect in the November 1990 *Notices*. The correct title is "André permutations, lexicographic shellability, and the cd-index of a convex polytope."

The name of David Halpern (Mathematics, University of Arizona) was spelled incorrectly in the November 1990 *Notices*.